HYPOXIA AND MOUNTAIN MEDICINE

EDITORS: JOHN R. SUTTON, GEOFFREY COATES AND CHARLES S. HOUSTON

TABLE OF CONTENTS

Acknowledgements viii
Foreword ix
Dedication – Hermann Rahn x
Charles S. Houston

SECTION I PSYCHOMOTOR EFFECTS OF HYPOXIA
Chapter 1 Task Learning Under Mild Hypoxia 1
Eric W. Farmer, Henry T. Lupa, Fiona Dunlop and John F. McGowan
Chapter 2 Noninvasive Monitoring of Cerebral Oxygenation and Hemodynamics by Near Infrared Spectroscopy 9
John S. Wyatt
Chapter 3 Cerebral Hypoxia in Fast Jet Aircrew: G-Induced Loss of Consciousness 18
A. Richard Prior
Chapter 4 Presyncope Induced by Lower Body Negative Pressure and Psychomotor Performance 27
David H. Glaister
DISCUSSION 37

SECTION II HORMONAL CONTROL OF ELECTROLYTE AND FLUID BALANCE IN HYPOXIA
Chapter 5 The Renin-Angiotensin-Aldosterone System during Hypoxia: Is the Adrenal an Oxygen Sensor? 42
Hershel Raff, Robert C. Brickner and Barbara Jankowski
Chapter 6 Role of the Peripheral Arterial Chemoreceptors in Electrolyte Homeostasis and Cardiovascular Regulation 50
Reinhard Behm
Chapter 7 Hormonal Control of Fluid and Electrolyte Balance at High Altitude in Normal Subjects 61
John R. Claybaugh, David P. Brooks and Allen Cymerman
Chapter 8 Aldosterone, Antidiuretic Hormone and Atrial Natriuretic Peptide in Acute Mountain Sickness 73
Peter Bärtsch, Sidney Shaw, Peter Weidmann, Mario Franciolli, Marco Maggiorini and Oswald Oelz

Chapter 9	Fluid, Electrolyte and Hormonal Metabolism in COPD *Mark O. Farber*	82
	DISCUSSION	89
SECTION III	CLINICAL ASPECTS OF HYPOXIA: FROM CELL TO ICU	
Chapter 10	Mechanisms of Liver Preservation Injury *Stephen W. Chung, Steven Strasberg, Claire M.B. Holloway and Gary A. Levy*	95
Chapter 11	Pathological Dependence of Oxygen Consumption *James A. Russell*	108
Chapter 12	Pathogenesis of Lactic Acidosis with Hypoxia *Allen I. Arieff*	115
	DISCUSSION	131
SECTION IV	OXYGEN DEPENDENCE OF MUSCLE METABOLISM AND WORK: INSECT-MAMMAL COMPARISON	
Chapter 13	Oxygen and $\dot{V}O_2$ max: Are Muscle Mitochondria Created Equal? *Raul K. Suarez*	136
Chapter 14	Allometric Scaling of Muscle Performance and Metabolism: Mammals *Hans Hoppeler and C. Richard Taylor*	143
Chapter 15	Allometric Scaling of Muscle Performance and Metabolism: Insects *Timothy M. Casey, C.P. Ellington and Julie M. Gabriel*	152
Chapter 16	Intestinal Determinants of Muscle Performance *Jared M. Diamond and Kimberley A. Hammond*	163
Chapter 17	ATPases and Energy Metabolism as Proactive and Reactive Components in Control of ATP Turnover Rates *Peter W. Hochachka and Gordon O. Matheson*	171
	DISCUSSION	186
SECTION V	EXERCISE IN THE HYPOXIC ENVIRONMENT	
Chapter 18	Work and Training at Altitude *Benjamin D. Levine, Robert C. Roach and Charles S. Houston*	192
Chapter 19	Pre-Acclimatization to High Altitude in a Hypobaric Chamber: Everest Turbo *Jean-Paul Richalet, Jacques Bittel, Jean-Pierre Herry, Christine Janin, Gustave Savourey, Jean-Louis Le Trong and Jean-François Auvert*	202
Chapter 20	Increased Glucose Dependency in Circulatory Compensated Hypoxia *George A. Brooks*	213
	DISCUSSION	227
SECTION VI	MECHANISMS OF HIGH ALTITUDE ILLNESS	
Chapter 21	Stress Failure in Pulmonary Capillaries: A Mechanism for High Altitude Pulmonary Edema *John B. West and Odile Mathieu-Costello*	229

Chapter 22 Subacute Mountain Sickness Syndromes: Role of Pulmonary Hypertension 241
Inder S. Anand and Y. Chandrashekhar
Chapter 23 The Role of Cerebral Blood Flow in Acute Mountain Sickness 252
Ralf W. Baumgartner, Peter Bärtsch, Marco Maggiorini, Andreas Thomi and Oswald Oelz
Chapter 24 Cerebral Spinal Fluid Pressure and Cerebral Blood Velocity in Acute Mountain Sickness 260
Glenn S. Hartig and Peter H. Hackett
Chapter 25 Hyperbaria and High Altitude Illness 266
Robert Roach and Peter H. Hackett
DISCUSSION 274

SECTION VII HISTORICAL LECTURE
Chapter 26 The Life and Work of Nathan Zuntz 279
Hans-Christian Gunga and K. Kirsch
Closing Remarks 292

ABSTRACTS 296

Appendix The Lake Louise Consensus on The Definition and Quantification of Altitude Illness 327